59TH Interdepartmental Hurricane Conference (IHC)

1. **Purpose:** To provide a summary of the 59th IHC, which was sponsored and chaired by Mr. Samuel P. Williamson, Federal Coordinator for Meteorology, from March 7-11, 2005, in Jacksonville, Florida. Each year, the Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM) sponsors the IHC to provide a forum for the responsible Federal agencies, together with representatives of the user communities such as emergency management, to review the Nation's hurricane forecast and warning program and to make recommendations on how to improve the program in the future. The theme of this year's conference was *The Nation's Tropical Cyclone Program: Priorities for the Next Decade*. The conference attendance was 213; for the sixth consecutive year, attendance has exceeded 200. The conference was cohosted by the Office of the Oceanographer of the Navy, which provided outstanding IT and public affairs support. The 59th IHC received excellent media coverage from The Weather Channel and the Jacksonville ABC and Fox affiliates. Portions of the conference were also filmed by NHK, Japanese Broadcasting Corporation for an upcoming news documentary. The proposed location for next year's conference is New Orleans, Louisiana, and will be cohosted by the NOAA National Weather Service Southern Region and FEMA. In addition, plans are being formulated to conduct a joint IHC/Pacific Tropical Cyclone Conference in 2006. In 2007, RADM Richard Behn, NOAA's Office of Marine and Aviation Operations, and Brig Gen Richard Moss, 403rd Wing Commander, have offered to cohost the 61st IHC in Tampa, Florida.

2. **Objectives:**
   - Review the Nation's tropical cyclone forecast and warning program from end-to-end, and update the *National Hurricane Operations Plan* for 2005.
   - Evaluate lessons learned from the 2004 hurricane season, with a focus on Hurricanes Charley, Frances, Ivan, and Jeanne which made landfall in Florida.
   - Examine the results of the Joint Hurricane Testbed (JHT) as a model for transitioning successful research results into operations.
   - Validate the ongoing efforts to develop a roadmap for tropical cyclone research and development with the goal to obtain peer review of the proposed roadmap and to begin developing a consensus on research priorities for the next decade.

3. **Key Events:**
   - Monday's Keynote Address by Dr. James R. Mahoney, Assistant Secretary of Commerce for Oceans and Atmosphere/Deputy Administrator of the National Oceanic and Atmospheric Administration (NOAA). Dr. Mahoney began by commending all groups (research community, front-line forecasters, first responders, citizens of Florida) for their preparedness, response, and recovery efforts during the 2004 hurricane season. In highlighting the lessons learned from the past season, he noted that the whole end-to-end system is vital to success and that a team approach is essential in handling the hurricane management enterprise. He also noted that the entire community (preparedness, response, and recovery) must be tightly integrated with the media and the public and that, at the height of the storm, all resources must share expertise and communicate efficiently. Finally, as NOAA's research "czar," Dr. Mahoney stated that our research programs are leading to better forecasts although much remains to be done. He highlighted the Joint Hurricane Testbed (JHT), which NOAA approved and funded in 2001, as a true success story in

transitioning research to operations. Now in its third round, the JHT has 15 ongoing projects, and with each completed project, we take another step towards better forecasts! Dr. Mahoney closed with three points: (1) our comprehensive team effort, of which the IHC is a key component, must continue, (2) research needs to increasingly focus resources on hurricane intensity and rainfall research, and (3) preparedness, education, and communication among all partners will be even more important in the next decade.

- Panel: *The Power of Partnerships*. Following the keynote address on Monday afternoon, RADM Richard R. Behn, Director, Marine and Aviation (NOAA), moderated a panel of senior agency representatives, which included Brig Gen Thomas E. Stickford, Air Force Director of Weather, Mr. Kim Curry, Deputy Technical Director for the Oceanographer of the Navy (substituting for RADM Steven J. Tomaszeski, Oceanographer of the Navy), Mr. Bill Proenza, Director, NOAA/National Weather Service Southern Region, Dr. Peter B. Ortner, Chief Scientist, NOAA/Atlantic Oceanographic and Meteorological Laboratory, and Dr. Richard Fisher, Deputy Director of the Earth-Sun System Division, NASA. The Air Force and Navy presentations highlighted the impacts on Department of Defense (DOD) operations during the past season caused by tropical cyclones and the importance of their partnerships with the national centers—National Hurricane Center, Central Pacific Hurricane Center, and the Joint Typhoon Warning Center—in making time critical decisions, regarding the protection of DOD assets and personnel. Mr. Proenza highlighted the importance of the partnerships that NOAA's National Weather Service must build with its customer base. The world's best forecast is of little use if it isn't received and appropriately responded to by the end user. Both Dr. Ortner and Dr. Fisher highlighted examples of how the Federal agencies have partnered in the past and noted agency plans to continue to partner in the future in the face of dwindling research dollars.
- Mr. W. Craig Fugate, Director of the Florida Division of Emergency Management, was the banquet speaker. Mr. Fugate provided a vivid description of the challenges Florida's emergency management community faced and continues to face after being ravaged by Hurricanes Charley, Frances, Ivan, and Jeanne during the 2004 hurricane season. For 2004, the Richard H. Hagemeyer Award, which is presented annually in honor of the longtime Director of the NWS Pacific Region and supporter of the IHC, was awarded to three recipients: Dr. Frank D. Marks, Jr., Director of NOAA's Hurricane Research Division, the 53rd Weather Reconnaissance Squadron—Brig Gen Richard Moss, Commander 403rd Wing accepting, and NOAA's Aircraft Operations Center—CAPT Steve Kozak accepting. The past winners were Prof. Russell Elsberry from the Naval Postgraduate School, Mr. Christopher S. Velden, Assistant Scientist, Space Science and Engineering Center, University of Wisconsin, and Mr. Max Mayfield, Director, NOAA's Tropical Prediction Center/National Hurricane Center.

4. **Summary of Results and Findings:**
   - The IHC has once again proved to be an extremely valuable forum to:
     - Bring the operational and research communities together to produce the best possible tropical cyclone forecast and warning program.
     - Address the needs of the Federal agencies and user communities that have a stake in the Nation's tropical cyclone program.
   - The agenda, to include the strategic planning workshop, was structured to evaluate the current state-of-the-science in tropical cyclone forecasting and, based on customer needs, to

provide some insight into where we should focus our research priorities over the next 10 years.

- Observations and Insights:
  - Tropical cyclone track. Still a top priority out to 5 days, especially for the Navy. We have seen significant improvement in track forecasts over the past 30 years. In fact, errors have been cut in half over the last 15 years. In 2004, the TPC/NHC 48-hour track forecast accuracy exceeded the NWS strategic plan performance measure target for FY 2010.
  - Tropical cyclone intensity. While we have seen improvements in intensity forecasts and there are ongoing projects that offer future promise for improvements, they have been much less dramatic for a number of reasons:
    - There are gaps in our understanding of the physics of tropical cyclones and their interaction with the environment.
    - There are deficiencies in routinely collecting data and assimilating it into the modeling system.
    - There are limitations in the numerical models themselves.
  - Impacts at landfall. To quantify the impacts at landfall will require:
    - Improved storm-surge guidance models, including guidance on breaking waves and featuring high resolution input and output (including probabilistic formats).
    - Operational analysis of the surface wind field (including maximum sustained winds) in tropical cyclones.
    - Guidance for changes in tropical cyclone size/wind structure and related parameters, including combined sea heights.
    - Guidance for tropical cyclone precipitation amount and distribution for coastal and inland flooding.
  - Interagency research strategy to advance track and improve intensity/structure and rain.
    - Acquire high-quality hurricane core and environmental observations.
    - Develop advanced data assimilation techniques for environment and hurricane core.
    - Develop an advanced modeling system like the next-generation hurricane prediction system (HWRF).
    - Develop a "disciplined" approach for transition of research to operations; e.g., the Joint Hurricane Testbed and the Joint Center for Satellite Data Assimilation.
    - Quantify the socioeconomic benefits of improved hurricane track and intensity forecasts.
  - 2004 Supplemental Funds. As a result of the active 2004 hurricane season, Congress provided supplemental funding which will provide for the transition to operations of the Stepped Frequency Microwave Radiometer (SFMR), the development of which was substantially funded by the OFCM, aboard the 53rd Weather Reconnaissance Squadron WC-130J aircraft, providing valuable hurricane core observations. The supplemental funding will also support the accelerated preparation of key data sets, supporting the timely development of the HWRF model, which is scheduled for transition to operations in 2007.

- *Strategic Research Plan for Tropical Cyclones*. Based on the peer review and feedback received during the IHC, the Joint Action Group for Tropical Cyclone Research, cochaired by Dr. Frank Marks, NOAA/HRD, and Ms. Robbie Hood, NASA, is prepared to complete its

strategic research plan for tropical cyclones, which will be an end-to-end-to-end document that details a vision and strategy to meet customer needs (from both a scientific and operational perspective). The document will serve as a guide and justification for ongoing and future research efforts and funding, and will link research priorities to customer/user needs and requirements over the next decade.

5. **Conference Action Items**:
   - Of the 13 action items brought to the IHC, 6 will be closed through incorporation into the *2005 National Hurricane Operations Plan*, which will be published by 15 May 2005. Two of the items were informational in nature, and one was withdrawn. The remaining four action items will be closed through normal staff action over the coming year.
   - At a minimum, the Joint Agency Group for Tropical Cyclone Research (JAG/TCR) will prepare and publish at least interim results by September 1, 2005.
   - Develop a comprehensive long-term interagency strategy for airborne reconnaissance observations (beyond the strategic research plan), as a subset of the GEOSS (Global Earth Observing System of Systems), that addresses the full range of observing technologies; e.g., manned, unmanned, spaced-based, SFMR upgrades, next-generation dropwindsonde, etc.
   - By October 2005, facilitate bringing together the web site owners from NHC, FEMA, USACE, etc., to discuss improved linkages, formats, and other related issues needed to improve customer use and understanding.
   - By June 2005, complete the OFCM-sponsored study entitled, *Warning Messages: Exploring Customer Understanding,* and then develop a path ahead to implement recommendations from the study to improve understanding and use of tropical cyclone forecasts and warnings.
   - By December 2005, facilitate bringing together the representatives from the provider, user, and communications communities to develop a plan to exploit current and developing technologies to improve tropical cyclone and hurricane forecasts and warning information dissemination.

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